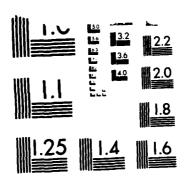
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Technical Report No. 6

Conductivity Studies on Hydroxide Ion Conductors in the Li-Al-O-H System at Intermediate Temperatures

by

Lie-Yea Cheng, Steven Crouch-Baker and Robert A. Huggins

Extended Abstract for a Paper to Be Presented at the 172th Meeting of the Electrochemical Society Honolulu, October 1987

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Conductivity Studies on Hydroxide Ion Conductors in the Li-Al-O-H System at Intermediate Temperatures

Lie-Yea Cheng, Steven Crouch-Baker and Robert A. Huggins

Dept. of Materials Science and Engineering Stanford University Stanford, CA 94305

It has been demonstrated that, in a wet environment at intermediate temperatures, a material of nominal composition Li₅AlO₄ will react with water to form LiOH (1,2). Under these conditions, "Li₅AlO₄" will support continuous direct current in the presence of Pt electrodes. This has been interpreted in terms of hydroxide ion conduction, leading to the possibility of using "Li₅AlO₄" as an electrolyte for the electrolytic decomposition of water vapor at intermediate temperatures (3,4).

The Li-Al-O-H quaternary phase diagram at intermediate temperatures has been constructed (5). Close inspection of this phase diagram reveals that compositions other than "Li₅AlO₄" should behave in a similar manner. This work reports preliminary results concerning the DC conductivity of several compositions in the Li-Al-O-H system at intermediate temperatures.

Acknowledgemen:

This work was supported in part by the Office of Naval Research.

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